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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,341	07/26/2001	Osamu Yuki	35.C15596	5665

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EXAMINER	
WHIPKEY, JASON T	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 10/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/912,341	YUKI ET AL.	
	Examiner	Art Unit	
	Jason T. Whipkey	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 June 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58* is/are pending in the application.

4a) Of the above claim(s) *24-58* is/are withdrawn from consideration.

5)☒ Claim(s) *15 and 16* is/are allowed.

6)☒ Claim(s) *1-14 and 17-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 July 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1/24/02, 1/23/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Restriction

1. Claims 24-58 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on June 17, 2005.

Drawings

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, Applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

5. The abstract of the disclosure is objected to because the phrase "is provided" is used on line 1. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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7. Claims 1, 2, 6-9, 13, 14, 17-21, and 23 rejected under 35 U.S.C. 102(b) as being anticipated by Cox (U.S. Patent No. 5,464,984).

Regarding **claim 1**, Cox discloses an image sensing apparatus (see Figure 9), comprising:

a plurality of image sensing elements (each of rows 550, 551, etc.) each including a plurality of photoelectric conversion sections (pixels 501); and

an adding circuit (horizontal clocks 511-513) adapted to add signals from said plurality of photoelectric conversion sections to obtain a one-pixel signal (the

clocks cause all the pixels in a row to be added together and averaged; see column 11, lines 56-66), wherein

said adding circuit adds the signals such that the one-pixel signals obtained by the addition (see column 11, lines 64-66) are arranged at equal intervals in an area extending over said plurality of image sensing elements (note that the rows in Figure 9 are evenly spaced; therefore, their centroids are arranged at equal intervals, as the pixel averages are representative of vertical pixels that have equal vertical spacing).

Regarding **claim 2**, Cox discloses:

the centroids of said photoelectric conversion sections are arranged at equal intervals in the area extending over said plurality of image sensing elements (note that the rows in Figure 9 are evenly spaced; therefore, their centroids are arranged at equal intervals, as the pixel averages are representative of vertical pixels that have equal vertical spacing).

Regarding **claim 6**, Cox discloses:

said adding circuit includes a charge adding circuit adapted to add charge levels of the signals generated in said plurality of photoelectric conversion sections (see column 11, lines 63-64).

Regarding **claim 7**, Cox discloses:

said charge adding circuit adds signals generated in photoelectric conversion sections of one image sensing element (see column 11, lines 56-66).

Regarding **claim 8**, Cox discloses an image sensing apparatus (see Figure 9), comprising:

a plurality of image sensing elements (each of rows 550, 551, etc.) each including a plurality of photoelectric conversion sections (pixels 501); and

an adding circuit (horizontal clocks 511-513) adapted to add signals from said plurality of photoelectric conversion sections to obtain a one-pixel signal (the clocks cause all the pixels in a row to be added together and averaged; see column 11, lines 56-66), wherein

each photoelectric conversion section is arranged such that the one-pixel signals obtained by the addition is arranged at equal intervals in an area extending over said plurality of image sensing elements (note that the rows in Figure 9 are evenly spaced; therefore, their centroids are arranged at equal intervals, as the pixel averages are representative of vertical pixels that have equal vertical spacing).

Regarding **claim 9**, Cox discloses:

the centroids of said photoelectric conversion sections are arranged at equal intervals in the area extending over said plurality of image sensing elements (note that the rows in Figure 9 are evenly spaced; therefore, their centroids are arranged at equal intervals, as the pixel averages are representative of vertical pixels that have equal vertical spacing).

Regarding **claim 13**, Cox discloses:

said adding circuit includes a charge adding circuit adapted to add charge levels of the signals generated in said plurality of photoelectric conversion sections (see column 11, lines 63-64).

Regarding **claim 14**, Cox discloses:

said charge adding circuit adds signals generated in photoelectric conversion sections of one image sensing element (see column 11, lines 56-66).

Regarding **claim 17**, Cox discloses an image sensing apparatus (see Figure 9), comprising:

a plurality of image sensing areas (each of rows 550, 551, etc.), each including a plurality of photoelectric conversion sections (pixels 501);

a plurality of output sections (transfer gate 523) adapted to output a signal on an each image sensing area basis; and

an image processing circuit (horizontal clocks 511-513) adapted to perform a processing so as to obtain an image from a first one-pixel signal obtained by adding signals from said plurality of photoelectric conversion sections extending over said plurality of image sensing areas (the clocks cause all the pixels in a row to be added together and averaged; see column 11, lines 56-66) and a second one-pixel signal obtained from each photoelectric conversion section (pixels signals need not be added together and averaged; they can be read out individually; see column 11, lines 27-55).

Regarding **claim 18**, Cox discloses:

the first one-pixel signal and the second one-pixel signal are arranged at equal intervals in an area extending over said plurality of image sensing areas (note that the pixels and rows in Figure 9 are evenly spaced; therefore, their

centroids are arranged at equal intervals, as the pixel averages are representative of vertical pixels that have equal vertical spacing).

Regarding **claim 19**, Cox discloses an image sensing apparatus (see Figure 9), comprising:

a plurality of image sensing elements (each of rows 550, 551, etc.) each including a plurality of photoelectric conversion sections (pixels 501);

a plurality of output sections (transfer gate 523) adapted to output a signal on a each image sensing area basis; and

an adding circuit (horizontal clocks 511-513) adapted to, when signals from said plurality of photoelectric conversion sections are added to obtain a one-pixel signal, add the signals from said plurality of photoelectric conversion sections extending over said plurality image sensing areas to obtain said one-pixel signal (the clocks cause all the pixels in a row to be added together and averaged; see column 11, lines 56-66).

Regarding **claims 20-23**, Cox discloses that the image sensing apparatus further comprises:

a scintillator plate (530; see Figure 11);

a signal processing circuit (gain stage 520) adapted to process signals from said image sensing elements (see column 11, line 66, through column 12, line 1); and

a radiation source adapted to generate radiation (see column 11, lines 33-35).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 3-5 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox in view of Pyyhtiä (U.S. Patent No. 6,552,319).

Claims 3 and 10 may be treated like claims 1 and 8, respectively. However, Cox is silent with regard to including a voltage adding circuit to add the signals.

Pyyhtiä discloses an x-ray imaging device that adds the signals from a number of pixels, including:

> an adding circuit includes a voltage adding circuit adapted to add the signals generated in said plurality of photoelectric conversion sections at a voltage level (see column 3, lines 51-55).

An advantage of performing addition of voltages rather than charges is that voltage signals in an image sensor are less susceptible to pattern noise. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Cox's imaging device add voltage signals, as described by Pyyhtiä.

Regarding **claims 4 and 11**, Cox teaches that:

> said voltage adding circuit is arranged so as to add signals generated in photoelectric conversion sections of one image sensing element (see column 11, lines 59-66).

Regarding **claims 5 and 12**, Cox and Pyyhtiä are silent with regard to arranging a voltage adding circuit so as to add signals generated in photoelectric conversion sections in a plurality of image sensing elements.

Official Notice is taken that pixel processing circuitry is commonly shared by an entire image sensor. An advantage of doing so is that sensor costs may be reduced in accordance with the reduction in parts. For this reason, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have Cox's and Pyyhtiä's image sensors use voltage adding circuits commonly to multiple image sensing elements.

Allowable Subject Matter

11. Claims 15 and 16 are allowed.

Regarding both claims, no prior art could be located that teaches or fairly suggests an image sensing apparatus comprised of a plurality of image sensing areas with a plurality of photoelectric conversion sections, wherein each of the areas include sections having different areas, and an adding circuit for adding pixels to obtain one-pixel signals arranged at equal intervals.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Whipkey, whose telephone number is (571) 272-7321. The examiner can normally be reached Monday through Friday from 9:00 A.M. to 5:30 P.M. eastern daylight time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu, can be reached at (571) 272-7320. The fax phone number for the organization where this application is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JTW

JTW
October 1, 2005

NGOC-YEN VU
PRIMARY EXAMINER